

## Deforestation and biodiversity: assessing threats and opportunities from cocoa

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### Introduction

- Climate change threatens future cocoa production and may lead to shifts in cocoa growing areas.
- Cocoa production itself contributes to climate change by being a major driver of deforestation.
- The cocoa sector, national governments and the international community are concerned about reduced cocoa productivity, loss of livelihoods and increased deforestation and biodiversity loss.

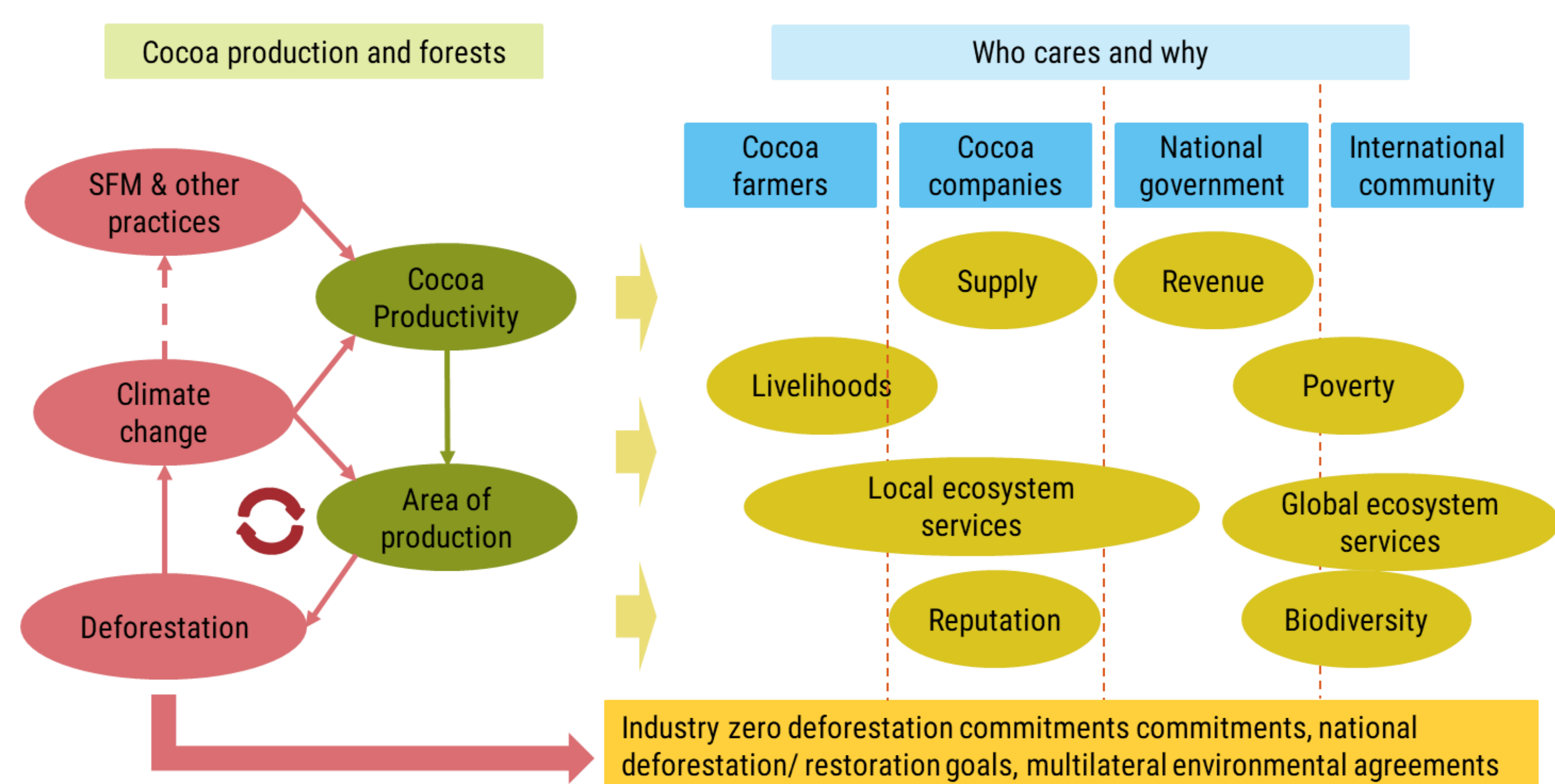


Fig 1: Simplified overview of interactions among cocoa production, climate change and deforestation, to whom it matters and why

Decision-makers need tools to inform sustainable cocoa intensification policy and planning under climate change at different scales: from the whole cocoa zone to local landscapes.

### Objectives

Develop tools to inform sustainable cocoa intensification policy and planning under climate change, including:

- Vulnerability and opportunity maps for biodiversity and ecosystem services, under climate change and different agroforestry scenarios.
- Knowledge on site-level impacts of different cocoa systems on biodiversity.
- Guidance to support management of cocoa landscapes for ecosystem services.

### Approach

Activities conducted at different scales will produce a package of knowledge products supporting land use planning at different scales.

Stakeholder engagement and dissemination coordinated with the wider CocoaSoils programme aims to support uptake and use of the tools.

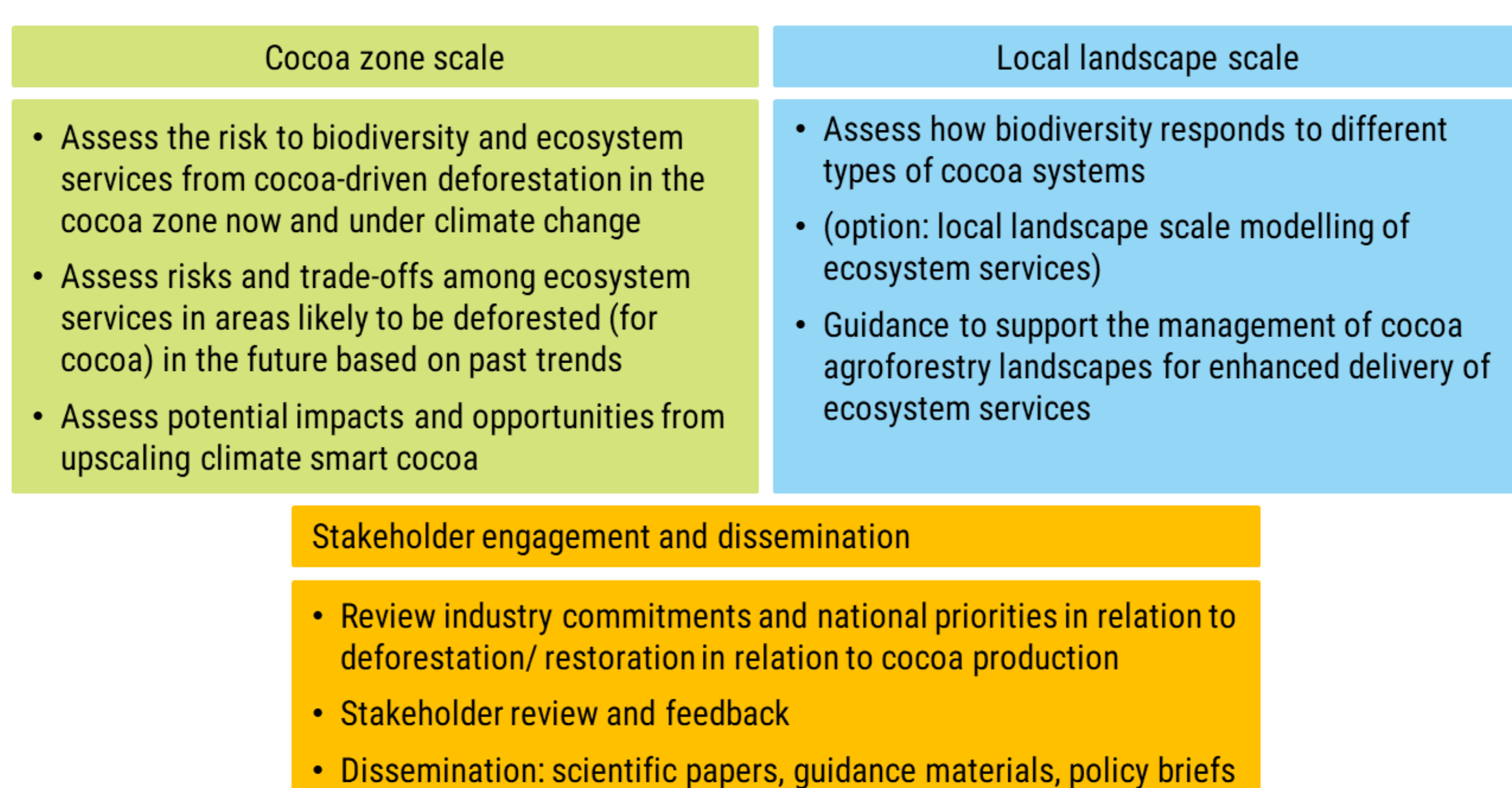


Fig 2 Activities conducted by UNEP-WCMC to inform sustainable and integrated cocoa intensification policy

### Initial results

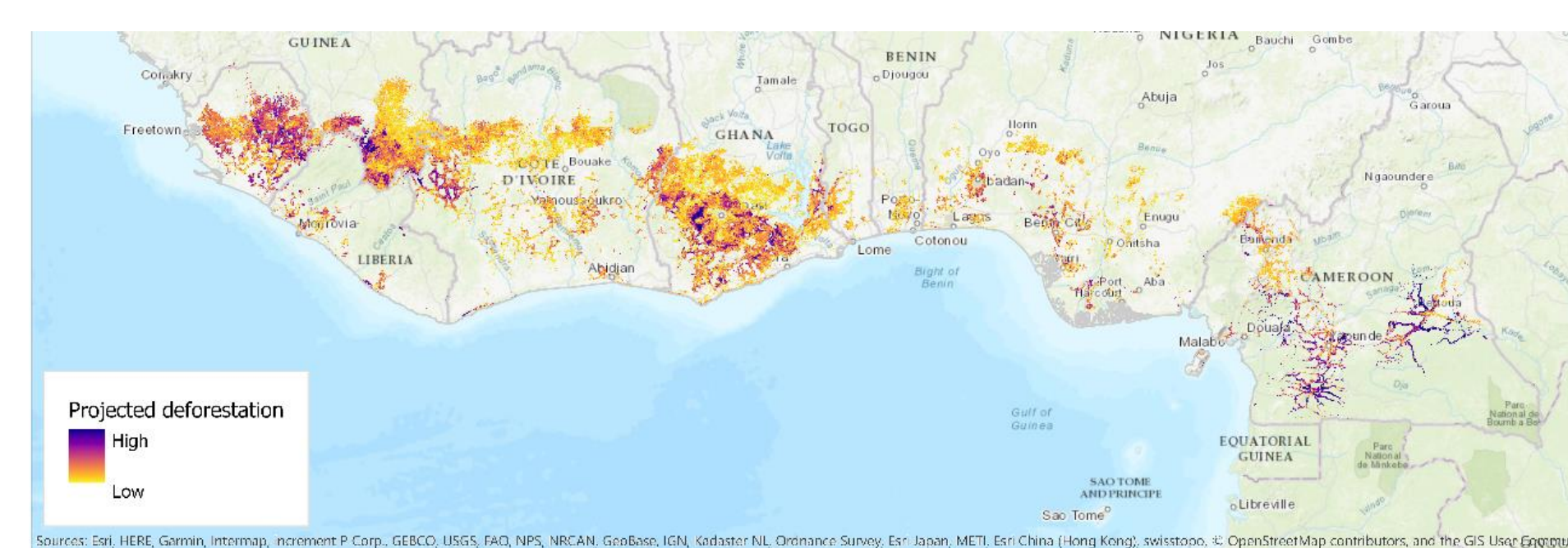


Fig 3: Projected deforestation within cocoa suitability zone up to 2050

Fig 4: Modelled change in carbon sequestration by 2050

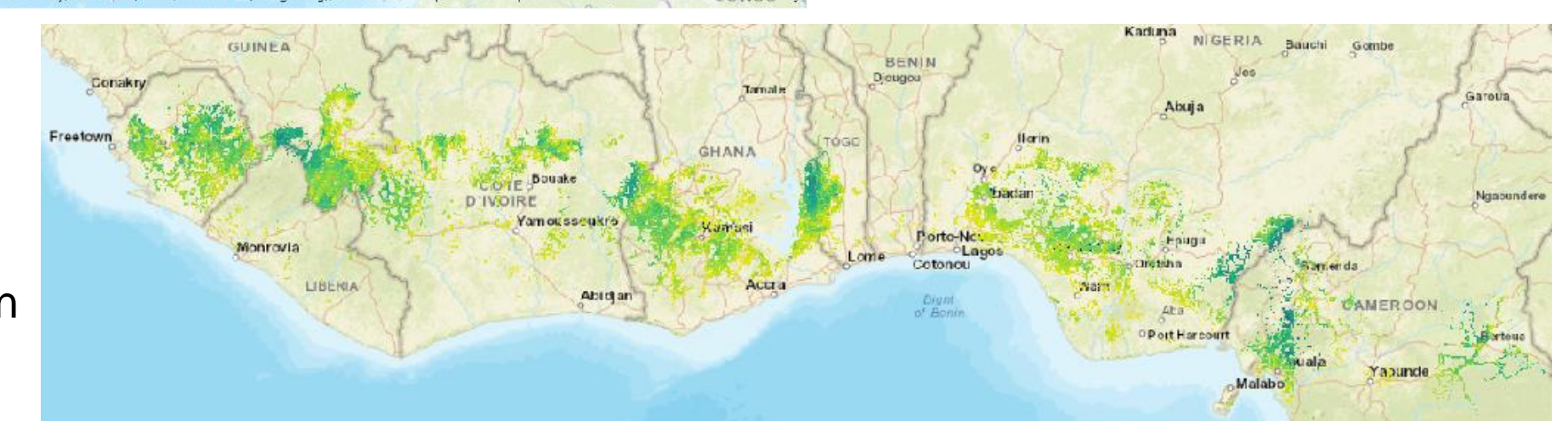


Fig 5: Modelled change in water provision by 2050

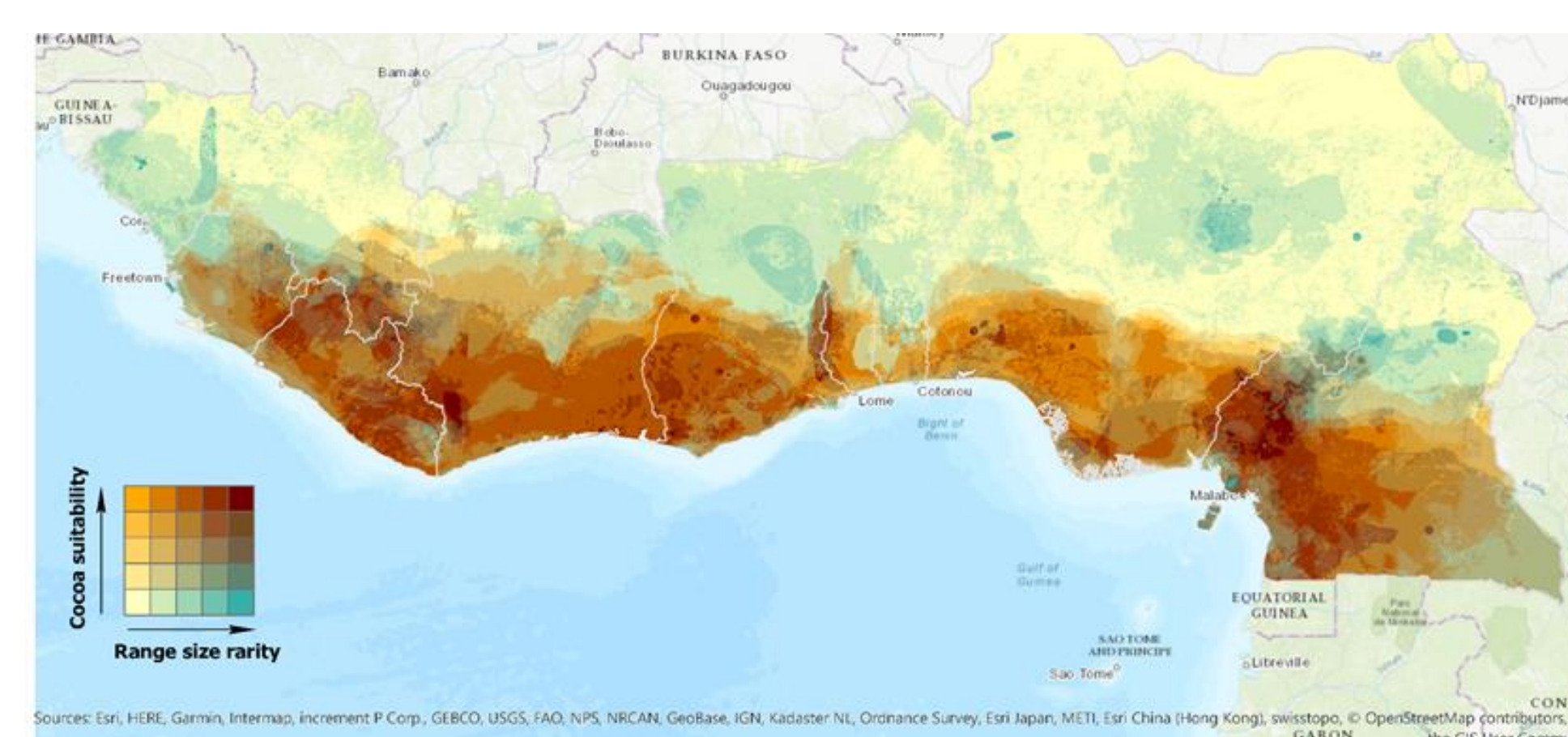


Fig 6: Bivariate map showing modelled cocoa suitability against biodiversity importance (based on range-size rarity) for all land cover

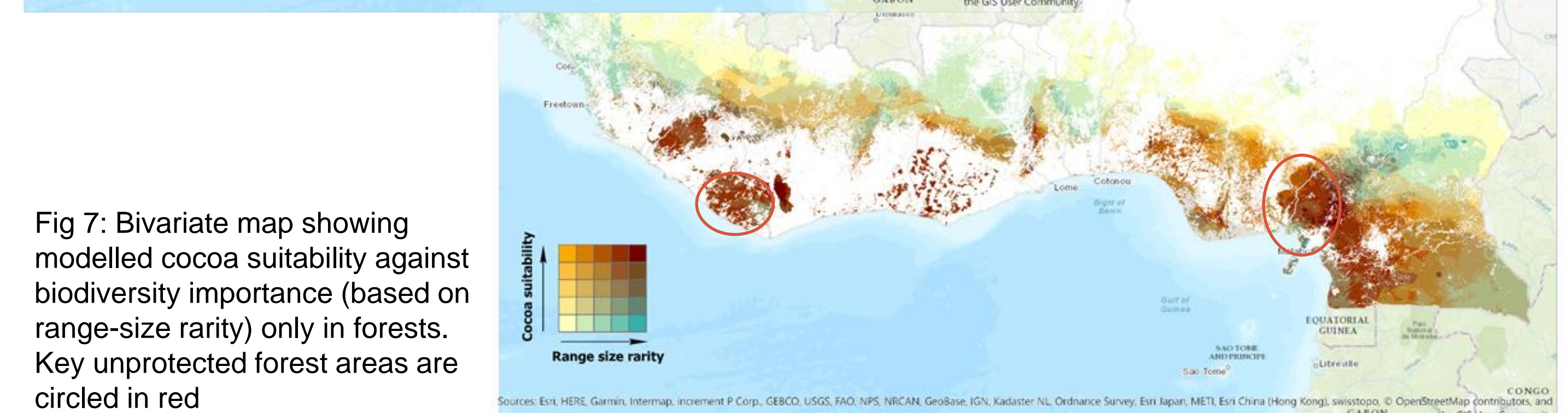


Fig 7: Bivariate map showing modelled cocoa suitability against biodiversity importance (based on range-size rarity) only in forests. Key unprotected forest areas are circled in red

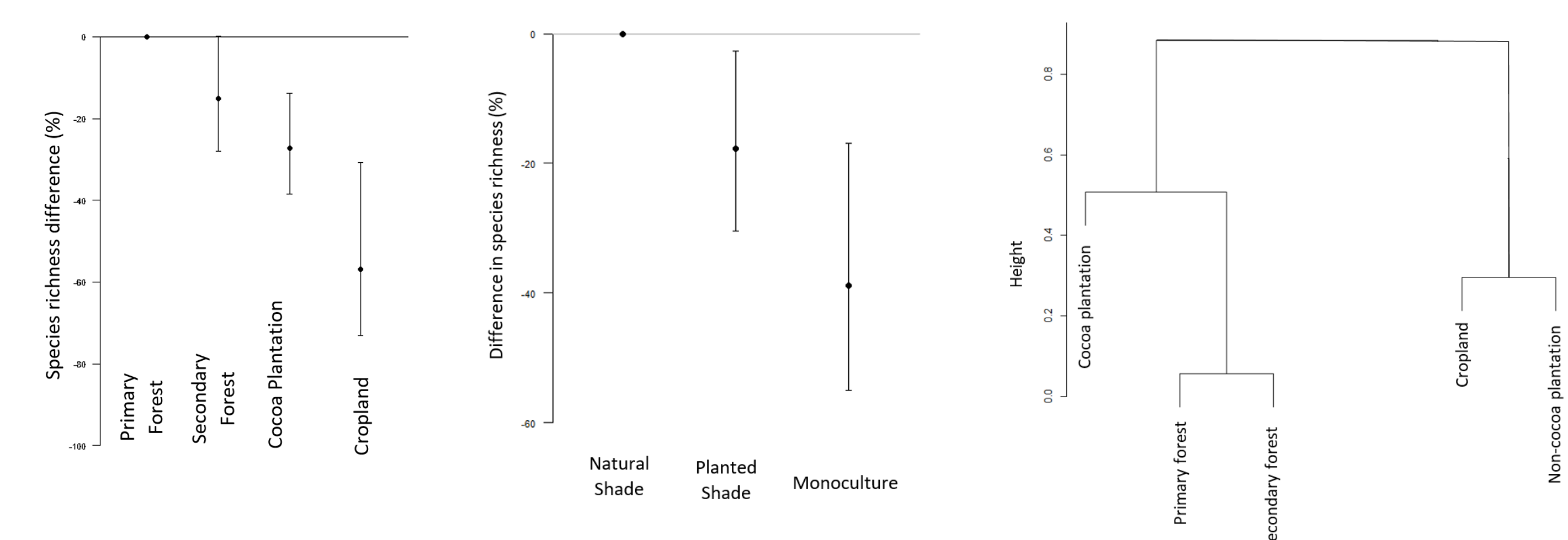


Fig 8: biodiversity in cocoa relative to other land uses and within different cocoa systems

### Discussion

- Different risks and opportunities regarding cocoa for different areas within the cocoa zone.
- Where land highly suitable for cocoa overlaps with high biodiversity values (i.e. Liberia and Cameroon, Fig.7) careful land use planning is needed, to limit potential impacts of cocoa development on species of high conservation concern (such as endemics).
- Where much forest has already been converted to agriculture (e.g. Cote d'Ivoire and Ghana), (cocoa) agroforestry systems could help increase tree cover, support some biodiversity, climate change mitigation goals and livelihood diversification.
- Further work will help inform these choices.

### References

IUCN Red List of Threatened Species (2017) Version 2017.3. <http://www.iucnredlist.org>.  
 UNEP-WCMC and IUCN. (2018). Protected Planet: The World Database on Protected Areas (WDPA) [Online], July 2018, Cambridge, UK: UNEP-WCMC and IUCN. Available at [www.protectedplanet.net](http://www.protectedplanet.net)  
 Schroth G., Läderach P., Martinez-Valle A.I., Bunn C. & Jassogne L. (2016) Vulnerability to climate change of cocoa in West Africa: Patterns, opportunities and limits to adaptation. Science of the Total Environment 556:231-241.